Effect on comfort of administering bubble-humidified or dry oxygen: the Oxyrea non-inferiority randomized study

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Résumé en anglais	BACKGROUND: The clinical interest of using bubble humidification of oxygen remains controversial. This study was designed to further explore whether delivering dry oxygen instead of bubble-moistened oxygen had an impact on discomfort of ICU patients. METHODS: This randomized multicenter non-inferiority open trial included patients admitted in intensive care unit and receiving oxygen. Any patient receiving non-humidified oxygen (between 0 and 15 L/min) for less than 2 h could participate in the study. Randomization was stratified based on the flow rate at inclusion (less or more than 4 L/min). Discomfort was assessed 6-8 and 24 h after inclusion using a dedicated 15-item scale (quoted from 0 to 150). RESULTS: Three hundred and fifty-four ICU patients receiving non-humidified oxygen were randomized either in the humidified (HO) (n = 172), using bubble humidifiers, or in the non-humidified (NHO) (n = 182) arms. In modified intention-to-treat analysis at H6-H8, the 15-item score was 26.6 ± 19.4 and 29.8 ± 23.4 in the HO and NHO groups, respectively. The absolute difference between scores in both groups was 3.2 [90% CI 0.0; + 6.5] for a non-inferiority margin of 5.3, meaning that the non-inferiority analysis was not conclusive. This was also true for the subgroups of patients receiving either less or more than 4 L/min of oxygen. At H24, using NHO was not inferior compared to HO in the general population and in the subgroup of patients receiving 4 L/min or less of oxygen. However, for patients receiving more than 4 L/min, a post hoc superiority analysis suggested that patients receiving dry oxygen were less comfortable. CONCLUSIONS: Oxygen therapy-related discomfort was low. Dry oxygen could not be demonstrated as non-inferior compared to bubble-moistened oxygen after 6-8 h of oxygen administration. At 24 h, dry oxygen was non-inferior compared to bubble-humidified oxygen for flows below 4 L/min.
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